In the Claims:

The following listing of claims replaces all prior listings in the application:

1. (*Original*) A method of producing spatially localized injury to vasculature in a live animal, the method comprising:

targeting vasculature in three dimensions for photodisruption; and

focusing ultrashort laser pulses on the targeted vasculature to produce localized photodisruption.

2. (*Original*) The method of claim 1, further comprising observing physiological parameters in the animal.

3. (*Previously presented*) The method of claim 1, wherein the step of targeting comprises using a microscope objective.

4. (*Original*) The method of claim 3, wherein the microscope objective has a numerical aperture within a range of 0. 1 to 1.3.

5. (*Original*) The method of claim 3, wherein the microscope objective is a component of a two-photon laser scanning microscope.

6. (*Previously presented*) The method of claim 5, further comprising observing the target vasculature using the microscope simultaneously with the photodisruption.

7. (*Previously presented*) The method of claim 1, further comprising observing the target vasculature using optical coherence tomography simultaneously with the photodisruption.

8. (*Canceled*)

9. (*Original*) The method of claim 1, wherein the step of targeting comprises using optical coherence tomography.

10. (*Previously presented*) The method of claim 1, wherein the laser pulses have an energy adapted to drive a nonlinear interaction within the target vasculature.

11. (*Previously presented*) The method of claim 1, wherein the laser pulses have pulsewidths in a range from 10 femtoseconds to 100 picoseconds.

12. (*Previously presented*) The method of claim 1, further comprising preparing the animal to provide optical access to the vasculature via a transparent window formed in the animal.

13. (*Original*) The method of claim 12, wherein the window is adapted to provide access for insertion of electrical probes.

14. (*Previously presented*) The method of claim 1, further comprising injecting the animal with a substance for labeling the blood stream.

15. (*Original*) The method of claim 14, wherein the substance is a water-soluble fluorescent tracer or fluorescently-labeled erythrocytes.

16. (*Previously presented*) The method of claim 1, further comprising measuring blood flow in the targeted vasculature.

17. (*Previously presented*) The method of claim 1, wherein the localized injury comprises vascular damage of a type selected from among thrombosis, hemorrhage and breach of the blood-brain barrier.

18. (*Original*) A method for in vivo modeling of vascular disorder, comprising:

preparing an animal for optical access to vasculature; and

targeting vasculature in three dimensions for photodisruption ; and focusing ultrashort laser pulses on the target vasculature to produce localized photodisruption, wherein the laser pulses have an energy adapted to drive a nonlinear interaction within the target vasculature.

19. (*Original*) The method of claim 18, wherein the step of targeting comprises using a microscope objective.

20. (*Original*) The method of claim 19, wherein the microscope objective has a numerical aperture within a range of 0.1 to 1.3.

21. (*Previously presented*) The method of claim 19, wherein the microscope objective is a component of a two-photon laser scanning microscope.

22. (*Previously presented*) The method of claim 21, further comprising observing the target vasculature using the microscope simultaneously with the photodisruption.

23. (*Previously presented*) The method of claim 18, further comprising observing the target vasculature using optical coherence tomography simultaneously with the photodisruption.

24. (*Canceled*)

25. (*Previously presented*) The method of claim 18 ,wherein the step of targeting comprises using optical coherence tomography.

26. (*Previously presented*) The method of claim 18, further comprising observing physiological parameters within the animal using one or a combination of two-photon laser scanning microscopy, magnetic resonance imaging, functional magnetic resonance imaging, multi-spectral intrinsic imaging, positron emission tomography, time resolved light scattering, Doppler flowmetry, and optical coherence tomography.

27. (*Previously presented*) The method of claim 18, further comprising observing physiological parameters within the animal using post-mortem histology.

28. (*Previously presented*) The method of claim 18, wherein the laser pulses have pulsewidths in a range from 10 femtoseconds to 100 picoseconds.

29. (*Previously presented*) The method of claim 18, wherein preparing the animal comprises forming a window for optical access to the target vasculature.

30. (*Previously presented*) The method of claim 18, wherein preparing the animal comprises injecting the animal with a substance for labeling the blood stream.

31. (*Original*) The method of claim 30, wherein the substance is a water-soluble fluorescent tracer or fluorescently-labeled erythrocytes.

32. (*Previously presented*) The method of claim 18, further comprising measuring blood flow in the targeted vasculature.

33. (*Previously presented*) The method of claim 18, wherein the localized photodisruption comprises vascular damage of a type selected from among thrombosis, hemorrhage, and breach of the blood-brain barrier.

34. (*Original*) A method for observing vascular disease or injury in real time, comprising:

preparing an animal for optical access to vasculature; and

targeting vasculature in three dimensions for photodisruption ;

focusing ultrashort laser pulses on the target vasculature to produce localized photodisruption, wherein the laser pulses have an energy adapted to drive a nonlinear interaction within the target vasculature; and observing physiological parameters of the animal before, during and after photodisruption.

35. (*Original*) The method of claim 34, wherein the step of targeting comprises using a microscope objective.

36. (*Original*) The method of claim 35, wherein the microscope objective has a numerical aperture within a range of 0.1 to 1.3.

37. (*Previously presented*) The method of claim 35, wherein the microscope objective is a component of a two-photon laser scanning microscope.

38. (*Original*) The method of claim 37, further comprising observing the target vasculature using the microscope.

39. (*Previously presented*) The method of claim 35, further comprising observing the target vasculature using optical coherence tomography.

40. (*Original*) The method of either claim 38 or claim 39, wherein the step of observing is performed simultaneously with photodisruption.

41. (*Original*) The method of claim 35, wherein the step of targeting comprises using optical coherence tomography.

42. (*Previously presented*) The method of claim 35, wherein observing comprises using one or a combination of two-photon laser scanning microscopy, magnetic resonance imaging, functional magnetic resonance imaging, multi-spectral intrinsic imaging, positron emission tomography, time resolved light scattering, Doppler flowmetry, and optical coherence tomography.

43. (*Previously presented*) The method of claim 35, wherein observing after photodisruption comprises using post-mortem histology.

44. (*Previously presented*) The method of claim 35, wherein the laser pulses have pulsewidths in a range from 10 femtoseconds to 100 picoseconds.

45. (*Previously presented*) The method of claim 35, wherein preparing the animal comprises injecting the animal with a substance for labeling the blood stream.

46. (*Original*) The method of claim 45, wherein the substance is a water-soluble fluorescent tracer or fluorescently-labeled erythrocytes.

47. (*Previously presented*) The method of claim 35, further comprising measuring blood flow in the targeted vasculature.

48. (*Previously presented*) The method of claim 35, wherein the localized photodisruption comprises vascular damage of a type selected from among thrombosis, hemorrhage, and breach of the blood-brain barrier.

49. – 58. (*Canceled*)